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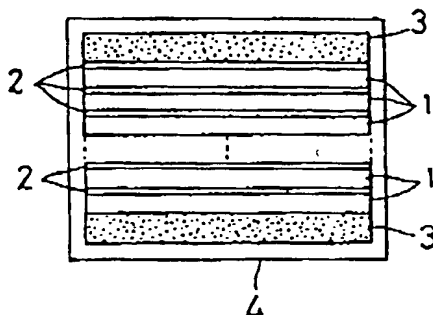
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(54) Packing material for pre-sensitized plates and package

(57) A packing material for pre-sensitized plates, which is produced from waste paper, and which has a pH of 7.0 or less, and The packaging material of claim 1 which contains polyacrylamide. The above packing material for pre-sensitized plates produced from waste paper does not degrade prin-out ability of the pre-sensitized plates.

**FIG. 1**



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BACKGROUND OF THE INVENTION

This invention relates to a packing material for pre-sensitized plates and a package of pre-sensitized plates using the packing material as pad board.

In general, pre-sensitized plate is composed of a support, such as an aluminum plate on which a light sensitive resin layer is formed. When the pre-sensitized plate is packed, a plurality of the pre-sensitized plates are stacked with interposing an interleaving paper between respective pre-sensitized plates in order to protect the light-sensitive resin layer. A pair of pad boards are laid on the top and under the bottom of the stack as a cushioning material for absorbing external force, and then, the stack is wrapped by a light-shielding paper to complete the package.

Heretofore, the pad boards is manufactured using chemical pulp, groundwood pulp, waste paper or the like as a raw material. An improvement of the pad board was proposed that the water content is made less than a prescribed value in order to prevent degradation of visual imaging ability by exposure of pre-sensitized printing plates (Japanese Patent KOKAI 3-36545).

A proposed interleaving paper for photographic material in Japanese Patent KOKAI 2-53999 is made of unbleached kraft pulp as the principal component, and has a pH measured by hot water extracting method of 5 to 9, so as not to affect adversely photographic properties.

However, even though pre-sensitized plates have good print-out ability, when they are packed using a material produced from waste paper as the pad board the print-out ability of pre-sensitized plates neighboring the pad board is degraded by storing for several months. The print-out ability in the specification is defined as a contrast ( $\Delta D$ ) between an exposed portion and an unexposed portion of a pre-sensitized plate.

SUMMARY OF THE INVENTION

An object of this invention is to provide a packing material for pre-sensitized printing plates produced from waste paper which does not degrade print-out ability of the pre-sensitized printing plates and a package using the packing material.

The present inventors have investigated as to the cause of the degradation of print-out ability by the pad board produced from waste paper, and found that the degradation of print-out ability is caused by ammonia gas. Then, they have further investigated and confirmed a means for not evolving ammonia gas.

Thus, the present invention provides a packing material for pre-sensitized plates, which is produced from waste paper, and which has a pH of 7.0 or less, and packing material for pre-sensitized plates produced from waste paper which does not degrade print-out ability of the pre-sensitized plates.

BRIEF DESCRIPTION OF DRAWING

Figure 1 is a sectional view of a package of pre-sensitized plates embodying the invention.

- 1 Pre-sensitized plate
- 2 Interleaving paper
- 3 Pad board
- 4 Light-shielding paper

DETAILED DESCRIPTION OF THE INVENTION

The pH of the packing material is 7.0 or less, preferably 6.0 or less, more preferably 5.0 or less. In general, the pH of paper boards produced from waste paper is 8.0 or more. Waste paper contains polyacrylamide as a paper reinforcing agent, draining agent or the like, and as a result, the paper board produced from waste paper contains polyacrylamide, as a maximum value of 1 weight %. The polyacrylamide decomposes under alkaline conditions to produce ammonia gas, and the ammonia gas neutralizes acids produced in a light-sensitive resin layer upon being exposed. Accordingly, acids necessary for discoloring dyes are thereby consumed resulting in the degradation of print-out ability. In this invention, the pH of the packing material produced from waste paper is rendered 7.0 or less to prevent the evolution of ammonia gas, resulting in the prevention of the degradation of printing out ability. In a high temperature period at 30 °C or higher such as in summer and in a high temperature region such as in the tropics, since the generation rate of ammonia gas from polyacrylamide increases, it is preferable to render the pH 5.0 or less. On the other hand, the pH is preferably 4.0 or more.

As acidic material for adjusting the pH, various inorganic or organic acids, such as sulfuric acid, phosphoric acid, phosphorous acid, malic acid, and salts being an aqueous solution acidic, such as aluminum sulfate and copper sulfate, are usable. Preferable acidic materials are aluminum sulfate.

The pH of the packing material can be adjusted by adding an acidic material, such as an acid or aluminum sulfate, in a paper-making process, applying an acidic material, such as an acid, to the surface of the packing material, such as pad board.

The waste paper used as a raw material of the packing material is not limited, and includes newspapers, magazines, advertising papers, corrugated boards, etc.

As the pre-sensitized printing plates, there are negative type plate, positive type plate, etc.

The packing material for pre-sensitized printing plates are materials used for packing the pre-sensitized plates for transportation, storing, etc. of them, and includes pad board, interleaving paper, light-shielding paper, outer packaging box, etc. The packing material contains waste paper, in general, in an amount of 50 % or more, particularly 90 % or more. When the pulp of the packing material contains other than that of waste paper, the remaining pulp may be conventional.

The thickness of the packing material is generally, in the case of pad carton, from 0.3 to 2.0 mm, particularly from 0.5 to 1.5 mm in the case of interleaving paper, from 30 to 100  $\mu\text{m}$ , particularly from 50 to 85  $\mu\text{m}$ .

A package of pre-sensitized printing plate comprises a stack wherein pre sensitized plate and interleaving paper are stacked alternately, a pair of pad cartons produced from waste paper laid on the top and under the bottom of the stack and a light-shielding paper wrapping them. In the package, the packing material of this invention can be used as the pad boards and the interleaving papers.

#### EXAMPLES

##### Examples 1, 2, Comparative Examples 1-3

Packages of pre-sensitized plates as shown in Figure 1 were prepared. The pre-sensitized plates 1 were "Positive Plate FPQ-J (Fuji Photo Film Co., Ltd.), and 30 sheets of the pre-sensitized plates 1 were stacked intervening an interleaving paper 2 made of wood pulp and synthetic pulp having a thickness of 50  $\mu\text{m}$ . Each one sheet of pad board 3 having a thickness of 900  $\mu\text{m}$  was laid on the top and under the bottom of the stack, and the stack was wrapped by a light-shielding paper 4 composed of a liner paper, a polyethylene film and an aluminum foil.

The pad boards used in each example are shown in Table 1. The pH of the pad board in Examples 1 and 2 were adjusted by controlling the adding amount of aluminum sulfate in the paper-making process.

Each package of pre-sensitized plates was stored in a thermostatic chamber at 45 °C at 75 % RH for 2 weeks, and print-out test was conducted as to the first pre-sensitized plate adjacent to each pad board. The results are shown in Table 1.

[Tabel 1]

Example	Pad Carton			Print-out Ability [ $\Delta$ , D] [Visual]
	Raw Material	Water Content	pH (25 °C)	
Example 1	Waste Paper	6.9 %	5.69	0.08 A
Example 2	Waste Paper	7.5 %	5.14	0.08 A
Comparative 1	Waste Paper	5.7 %	8.49	0.01 C
Comparative 2	Waste Paper	6.2 %	8.01	0.01 C
Comparative 3	Virgin Pulp	6.8 %	6.53	0.08 A

PH Measurement

1 g of sample was cut into small pieces, and put in 70 g of distilled water. After sturing 3 hours, the pH was measured by a glass electrode at 25 °C.

Print-out Ability

## Exposure Conditions:

Exposing Apparatus: Metal halide lamp Al Dolphin (Al Graphic Service Co., Ltd.)  
 Distance: 90 cm  
 Quantity of Exposure: 42 counts

## Density Measurement:

Densitometer: "Macbeth RD 918" (Kollmorgen Corp.) with a visual color filter

## Visual Evaluation:

A: Excellent (After exposure, image can be seen clearly.)  
 C: Bad (After exposure, image cannot be seen.)

Examples 3,4, Conventional example 4

An aqueous solution of 20 % acid was applied on both surfaces of a paper board produced from waste paper. The paper board was dried naturally, and used as the pad board. The acids used are shown in Table 2.

The other packing conditions are the same as Example 1.  
 The results are shown in Table 2.

[Table 2]

Example	Pad Carton			Print-out Ability [ $\Delta$ Visual] <sup>D</sup>
	Acid Coating	Water Content	pH (25 °C)	
Example 3	Phosphorous Acid	10.6 %	5.57	0.08 A
Example 4	Phosphoric Acid	10.6 %	6.02	0.08 A
Comparative 4	None	7.3 %	8.43	0.02 C

Testing methods are the same as Example 1. As shown in Tables 1 and 2, this invention surprising by improves the print-out ability in package of pre-sensitized plates. As many apparently widely different embodiments of this invention may be made without departing from the spirit and scope thereof, it is to be understood that the invention is not limited to the specific embodiments thereof except as defined in the appended claims.

Claims

1. A packing material for pre-sensitized printing plates, which is produced from waste paper, and which has a pH of 7.0 or less.
2. The packaging material of claim 1 which contains polyacrylamide.

3. The packaging material of claim 1 which has a pH of from 7.0 to 4.0.
4. The packaging material of claim 1 of which the pH has been adjusted by sulfuric acid, phosphoric acid, phosphorous acid, or Malic acid.
5. The packaging material of claim 1 of which the pH has been adjusted by aluminum sulfate.
6. The packaging material of claim 1 which is pad carton or interleaving paper.
7. A package of pre-sensitized plate which comprises a stack wherein pre-sensitized plate and interleaving paper are stacked alternately, a pair of pad board laid on the top and under the bottom of the stack and a light-shielding paper wrapping the stack with the pad boards, wherein the pad boards are produced from waster paper and have a pH of 7.0 or less.
8. The package of claim 7, wherein the interleaving papers are produced from waster paper and have a pH of 7.0 or less.

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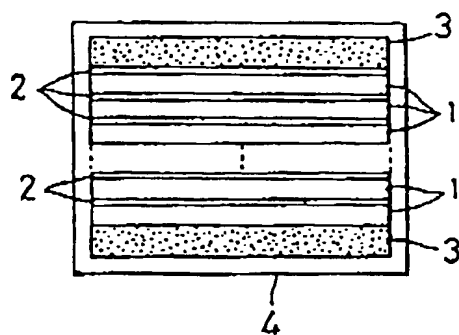
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**FIG. 1**



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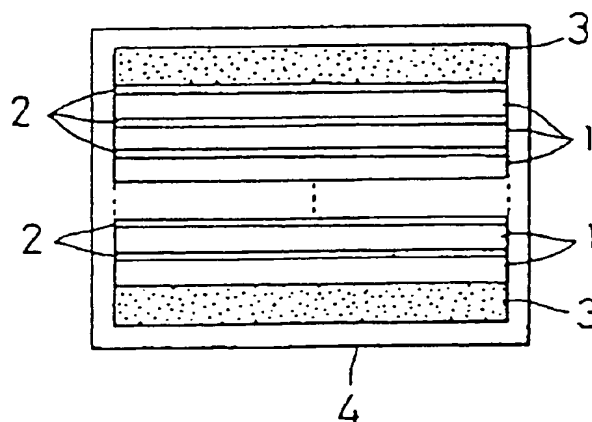
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**FIG. 1**



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# EUROPEAN SEARCH REPORT

Application Number  
EP 95 10 8912

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	PATENT ABSTRACTS OF JAPAN vol. 18, no. 349 (P-1763), 30 June 1994 & JP-A-92 239382 (MITSUBISHI PAPER MILLS), 29 March 1994, * abstract *	1,3,4	B65D65/38 G03C3/00 D21H11/14
Y	---	6,7	
Y	PATENT ABSTRACTS OF JAPAN vol. 15, no. 172 (P-1197), 30 April 1991 & JP-A-89 171494 (KONICA), 18 February 1991, * abstract *	6,7	
A	---		
A	EP-A-0 362 823 (FUJI PHOTO FILM) 11 April 1990 * abstract * * page 4, line 22 - line 23 *	2,5	
A	PATENT ABSTRACTS OF JAPAN vol. 14, no. 227 (C-0718), 15 May 1990 & JP-A-88 198859 (FUJI PHOTO FILM), 22 February 1990, * abstract *		TECHNICAL FIELDS SEARCHED (Int.Cl.6)
A	---		B65D G03C D21H
A	PATENT ABSTRACTS OF JAPAN vol. 18, no. 48 (P-1682), 25 January 1994 & JP-A-92 067529 (MITSUBISHI PAPER MILLS), 22 October 1993, * abstract *		
A	---		
A	EP-A-0 436 133 (FUJI PHOTO FILM) * the whole document *		
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 24 September 1996	Examiner Gino, C
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document	

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